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ABSTRACT

The development of a modularized program for secondary educational psychology students at the University of Colorado is reviewed. The beginning stages and prototype produced are described, but emphasis is on the revision of the first system. Changes in the course, covering both educational and adolescent psychology, include expansion of the number of modules, addition of contract and consultation procedures, and revision of the course overview and instructor manual. A brief analysis is made of the decision to turn down other presently available systems for a newly devised modular system. The latter part of the review deals with the characteristics of the program and development problems encountered. Basic module structure, which includes a management sequence, set of objectives, student study guide, and evaluation procedures, is outlined. Proposed revisions include changes in the required module load, strategies to broaden student learning experiences, and addition of lectures. (Author/KSM)

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Round two: a modularized/individualized secondary educational psychology course.

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Paper presented at the Annual Meeting of the
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Before we get into our presentation, we feel it only fair to note that our talk is essentially an outline of some of the ideas included in the prepared paper. Actually, we have detailed our program, along with supporting research, but to try to read the paper in its entirety would defeat the informational objectives. We are not forsaking our commitment to cite previous research, because in our present political climate it is imperative to point out that your crimes are less heinous if you can show that somebody else did something like it before you. On the other hand, listing research articles and authors is like trying to go through the telephone directory, and just as exciting.

Moreover, we've got another problem. Last year when we presented data on the first phase of this program, the time slot allotted was switched at the last second, and I can assume that very few people here now, if any, ever heard about Phase I (or Round I). So forgive occasional references to the 1972-1973 data. A full report has been published elsewhere (Langer, 1973).

Basically, in the Spring of 1972 we began to develop a modularized program for secondary educational psychology students at the University of Colorado. Secondary educational psychology at the University of Colorado means that course covers both educational and adolescent psychology. From the outset the program had several characteristics which we would like to describe:

a) The program was to be academically effective and efficient, incorporating elements of both educational and adolescent psychology.

b) The program was to be flexible enough to be incorporated in a variety of management systems.

c) The program would operate on minimal resources. Heavy emphasis was placed on commercially available texts and the use of work-study personnel (i.e. nonprofessionals) to implement the course.

d) The program would meet the evergrowing needs for competency-based teacher training programs.

e) The instructional system would serve as an instructional model for preservice interns.

f) The program could be easily disseminated. Therefore, a complete management/assessment system was developed to help potential users implement the program.

In the Fall of 1972, we tried out a first stage prototype, which consisted of 27 instructional modules in eight instructional areas, a Student Guide, a student record-keeping system, and an Instructor's Manual. Of the 27 modules, five were required and 22 were optional (Langer, 1973).

Basically the system is a variant of Keller's (1968) approach, although we wish to apologize if this variant is something he never had in mind. Essentially, the module spells out the learning task undertaken by the student. The student, upon completion, immediately takes some form of assessment. If successful, the student moves on. If not, he is given an additional evaluation. We'll get to the basic module structure shortly.

In the summer of 1973 we began a drastic revision of the system, which we have labeled for want of a better term, Phase II (and ignore the political implications).

The most drastic change resulted in an expansion of the module numbers from 27 to 97, and an increase in subject areas from eight to 12. The areas

included: 1) motivation; 2) learning; 3) intelligence-creativity; 4) tests and measurement; 5) the exceptional child; 6) the disadvantaged child; 7) group processes; 8) adolescence-development; 9) adolescence-social behavior; 10) adolescence-sexual development; 11) adolescence-personality; 12) adolescence-youth: problems and perspectives. The increase in module content from 27 to 97, and the increase in subject areas from 8 to 12 resulted in shorter and more heavily focused modules, which alleviated a significant student criticism.

We also developed a management area module for each of these 12 subject areas. Each area management module included a brief description of the whole system, a statement of rationale for the area, and a description of each module within that given area. To handle an earlier problem in the first phase, some modules in some areas were designed for students with no general psychology background at all. Students with a general psychology background could waive such modules.

The number of required modules was increased to 25, and all of these employed some form of objective testing. However, many of the higher-order modules within a given area now utilized an essay-type response, labeled in our system Report, along with provision for a Conference, which a student could request after the paper was received.

In addition, we designed a Contract procedure, which requests the student to indicate which modules he would take. The Contract was designed to (a) commit the student and sustain him within the system, and (b) to provide a model for his own future classroom activities.

We also provided for a Consultation. This was a conference with a staff member regarding any problems, either within the instructional system or in

the student's own classroom activities. Finally, we also developed a form called Application Evaluation. The purpose was to have the student observe in the classroom instances of pupil behavior which demonstrate principles and concepts acquired in the course. Specifically, the form asks the student to report: (a) the specific behavior; (b) the principle which is illustrated; and (c) the module in which the concept was encountered. The data is absolutely essential if we are to have any estimate of the saliency of the concepts we were teaching, a point which DeCecco (1971) raised previously.

Moreover, we expanded the Student Guide, now called the Course Overview, to include a much more detailed description of the program and the rationale behind it. The student record-keeping form was changed somewhat in format to make up for the increased number of modules. The Instructor Manual was expanded slightly.

Before discussing the specific modular system we have devised, it probably would be worthwhile to briefly discuss why we turned down other systems presently available. This brief analysis is made in the light of what we considered to be essential to our program success. Technically speaking, there is no secondary educational psychology program comparable to our own. The second part of the review will be with the characteristics of our program and the development problems we have encountered.

There are a number of individualized and/or modularized educational psychology systems now in existence across the country (e.g. Michigan State University, University of Houston, Weber State College, etc.). These programs are essentially variations of Keller's (1968) ideas, which have generally proved superior to traditional instructional formats in terms of student

achievement (Born, et. al., 1972: Cooper and Greiner, 1971; Witters and Kent, 1972). However, many of these systems were designed primarily to meet the specific needs and resources of their institutions, with no particular plans for dissemination.

One notable exception is the Weber State College materials which have been disseminated. However, an examination of their modular approach yields several problems from our point of view. First of all, much of the modular content is managed in a very traditional manner. For example, students are asked to read pages in a text without further instructional aid to the student. Second, we have not encountered any systematic/quantitative analysis of the program (although one may be in existence). Finally, there does not seem to be any comprehensive management system. It must be pointed out that a program which was intended for dissemination at the outset has certain characteristics which we shall discuss throughout this paper.

There are several programs for which data have been reported (e.g. Galloway, 1972; Treffinger and Davis; 1971). These systems were not utilized for several reasons. For example, the Galloway (1972) approach still uses a very heavy instructor input (which is a traditional instructional format we wanted to avoid),while the Treffinger and Davis program (1971) employs a project orientation which appeared very difficult to describe, much less implement.

We should like to emphasize again, that our analysis of these programs is made in the light of what we considered to be necessary if our program were to be disseminated. Obviously, other individuals and other institutions might see things quite differently with respect to these programs.

Moving on to the modular characteristics of our own system, we should like to again repeat that while our present structure retains the essential

characteristics as outlined in the 1972-1973 report (Langer, 1973) several significant changes did take place. The basic module structure (and subsequent modifications) is as follows:

(a) Each module contains a management sequence. This sequence directs the learning activities of the students. The information includes the text assignment, the kinds of assessment activities, etc. Nearly all writers in the area of instructional psychology, (e.g. Wilson and Tosti, 1972; Davis, et.al., 1974;) emphasize the need for specific sequencing and description of activities. Indeed, many people first attempting a modular system often neglect this critical point with the result that the students wander around for a long time trying to figure out what it is they are supposed to be doing (or bug the instructor to tears).

(b) Each module contains a set of objectives. The objectives are presently couched in terms of what a student should be able to do. For example, an objective in a learning area module might read: "List the basic steps in classical conditioning". The reader will note that the format occupies a position somewhere between Meager (1962) and Gronlund (1972). The value of behavioral objectives has been a subject of some research. Jenkins and Demo (1971) have argued that behavioral objectives do not lead to differences in achievement, while Rothkopf and Kaplan (1972) have found that narrow objectives lead to more intentional kinds of learning. However, since we wanted this program to serve as a model for students in teaching, and considering the very heavy emphasis now placed upon teacher accountability, we have kept the objectives.

(c) For those texts that were programmed or semi-programmed (programmed in the sense that students had to actively respond to integrated materials) no additional study instructions were prepared for the student. However, if the text format was traditional, a student study guide was prepared. The study guide is labeled Prompting Questions, and consists of a series of questions designed to guide the student through the text. Space is provided for the student to respond. The value of such questions has been well established by Webb and Schwartz (1959). It is interesting to note that student reaction to these questions has always been positive. We might add that this integration of student guide and text is in direct contrast to most encyclopedic formats. Authors may frequently provide a study guide, but these are usually never regularly integrated into the text proper. Unless the instructional system makes a conscious effort to do so, study guides may never be used unless the student is in trouble.

(d) The evaluation procedure for the first (1972-1973) phase of the program consisted entirely of objective tests called Learning Checks in our system. Two alternate forms were provided for each section of a module. The tests averaged about 11-12 items per Learning Check and a passing criterion of 80% was established. Obviously, one measure of the efficiency of the module is the percentage of students passing the first Learning Check. In the first year, about 88% passed the first Learning Check which indicates that the module structure was effective with respect to cognitive achievement.

To repeat, in Phase I, we established the principle of utilizing objective assessment for required modules. We simply lacked the necessary staff to evaluate essay or short-answer type exams, get them back within a reasonable amount of time, and still have a valid assessment system.

In our revisions for the second year, we did make some changes. The Learning Checks are still used for the required modules. We increased the average number of items per Learning Check to about 15-16 to increase reliability. We also varied the passing criteria between 70 and 80% depending upon the difficulty of the material. We'll report our data later with respect to this.

It might be worthwhile at this point to discuss our actual evaluation procedures. We will first present the Learning Check system. As discussed earlier, the student studies the text materials, then immediately takes the first Learning Check. Research evidence seems to indicate that immediate assessment helps strengthen responses (Anderson and Myrow, 1971). Upon completing the Learning Check, the student returns his paper to a staff member who scores it in the student's presence. Thus, the student receives immediate feedback. We recognize the issue of immediate vs. delayed feedback on meaningful materials is a complex problem, but we think we have handled it fairly well. (Kuhavy and Anderson, 1972; Means and Means, 1971)

The student is allowed to challenge any answer marked incorrect with supporting materials. If he can defend his

interpretation or supply data supporting his response, we will give him credit for the answer. This may involve a complex exploration by the student, and the additional learning is often worth the effort. If the student fails, he can take a second Learning Check. In Phase I 88% of the students passed the first Check, while about 1% failed both. This emphasis on frequent testing over short amounts of materials seems to be much better for learning and retention (Kingsley and Garry, 1957; Roderick and Anderson, 1968).

As we indicated earlier, we considerably expanded the modular system in Phase II, and varied the passing criteria between 70 and 80%. Our preliminary data for this year indicates that for the required modules (N=25) the average rate passing the first Check was 89.6% with a low of 60.3% for one section of a programmed learning module, to a high of 99.4% for a module on adolescent-psychology utilizing a traditional text and Prompting Questions. The percentage failing both tests was approximately 2%, just slightly higher than the previous year.

For the Reports (our essay-type responses) the student submits his paper and we try to return it in 48 hours. Since the Reports are used for optional modules this procedure is not all that difficult. The responses tended to be quite complete conceptually, and interesting as to comments on impact. The criteria were essentially based on internal logic. The Conferences associated with the Reports were not all that fruitful.

(e) In addition to the Learning Check data, each module contains a General Evaluation form designed to yield additional system information. The student is asked on this form to indicate the following:

1. Whether or not the objectives of the module had been met. It is interesting to note that in the first year, along with our 88% rate for passing the first Learning Check, we also found that every objective on every module was seen by a majority of the students as being achieved.
2. The student is also asked to determine whether the text for the module should be retained. Again, the data is quite interesting. For both years, a majority of students have voted to retain every text for every module.
3. We also asked the students to make additional open-ended comments regarding each module. The reader is referred to a previous publication (Langer, 1973) for a full discussion of comments for the 1972-1973 years. The 1973-1974 data has not been fully analyzed.

Although, much of our data analysis is still incomplete at the time of writing, we have sufficient evidence to make some judgements regarding the 1973-1974 system.

The Contract form seems to work well with most students. At least some of them saw it as a potential model for their own particular classroom.

The Application Evaluation yielded some very interesting data. As you may recall, we asked students to note behavioral instances of principles learned in class. We got a wide variety of principles/behaviors, although

certain concepts seemed to show up more heavily than others. This we construe as a measure of saliency. The Application Evaluation data would seem to indicate the student can at least make the jump from concept to observation.

The area management module system proved to be bust, except for the module content page. Right now we plan to place the module management page at the beginning of each subject area, and forget the rest. The Consultation idea was not too successful. This was a conference option for a student to discuss general problems. We did have a lot of activity but for some reason or another, they just simply refused to mark it as a Consultation.

The next change is fairly drastic since it involves some dissemination factors. It should be emphasized that the big increase in content module numbers from 27 to 97 was also based on an R & D problem. The strategy evolved from the fact that the 1972 - 1973 data showed the module structure to be highly efficient and effective in terms of student achievement. To test the assumption that this data was valid and reliable, we decided to apply our module structure principles over a wide variety of texts and subject areas: hence the jump to 97 content modules. We might add the strategy incidentally was similar to the one utilized at the Far West Laboratory for Educational Research and Development for the development of the minicourse model. The major advantage of this approach is that if you are successful, you are in an immediate position to make valid decisions regarding the conceptual directions the system will take. The disadvantage is that it decreases flexibility in terms of allocating time and resources for other system components. Right or wrong (or perhaps influenced by our previous R & D experiences) we chose to test the limits of our instructional tactics.

As we noted before, the 1972-1973, and 1973-1974 findings parallel each other. That is, (1) an equally high percentage of students passed the first Learning Check in both years, and (2) this correlated with data indicating that the behavioral objectives of each module had been considered as met and that the module texts had been regarded as acceptable. This indicated to us that our instructional strategies insofar as the content modules are concerned were sound. We feel that aside from some additional polishing and simple yearly changes, this part of the instructional system is acceptable.

However, as we indicated earlier, the strategy pays a price in course flexibility. In resource terms, if the 185 students take 25 modules (which was the situation this year)the result is a total of 4,625 interactions, which leaves little time for other activities. A major student complaint was lack of course variety, along with the number of required modules. Some of our revisions are as follows:

(a) First of all, we plan to reduce the required module load to 12 - 13 modules for students with some background in psychology, and 14 - 15 for students with no background. The required areas include: learning, motivation, intelligence-creativity, adolescence-development, adolescence-social behavior and adolescence-sexuality. Each area will contain at least two different module sequences for completion. These changes are also based on some field testing and dissemination possibilities. The number of subject areas has been increased to 13, and the instructional areas have been separated into two volumes. These implications of these decisions will be discussed shortly.

(b) We are still undecided as to the optional modules. By insisting on a fixed number in the past, we have found that student choice was often always based on valid system criteria. In the past we justified a fixed number on the grounds it provided data on additional modules. However, now that our data appears adequate, we can no longer use this approach.

Therefore, to broaden the learning experiences of the students, we have decided on the following strategies:

(1) We will ask other staff members who work with our students to recommend additional work to meet performance efficiencies of classroom performance. We feel that 70 modules in 13 areas will meet most students needs.

(2) We intend to utilize and simultaneously systematically analyze small group discussions. The extent of our analysis/utilization of discussions will depend upon outside funding. If the external funds are provided, then a systematic research program will be established, testing the significance of several group factors in relation to the effectiveness of small group discussion. The group factors include leader-led vs. leaderless, and fixed-topic vs. problem-solving. The effectiveness of these discussions will be based on the degree to which students can apply text principles to classroom activities. As we noted before, the Application Evaluation data indicated they can make a jump from principle to observation; now we want them to make a

jump from principle to application. If outside funding is not received, a more limited (and probably less systematic) program will be implemented.

(d) Several lectures will be given in areas to be chosen shortly. The lecture technique will also be assessed with the possibility of using his technique as a partial alternative and/or supplement will be explored.

And finally, the possibilities of some limited dissemination for this fall. At the time this paper was prepared (mid March), a final grant proposal has been submitted with quite good prospects of funding. If funded, and we will know shortly, we would like to test our program at various sites. By dividing the areas of educational and adolescent psychology into two volumes we have somewhat greater flexibility. We will be able to supply Student Manuals in either or both areas, an Instructor Manual, and a complete set of Learning Checks as well as other forms for each student. The site would have to supply the needed commercial texts for implementation of the system (which is not large), and personnel. In addition, the site would supply data collected from the students, as well as describe problems of implementation.

If you are interested, we would like you to contact us either after this meeting, or at the University of Colorado.

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